

**Massachusetts Department of Environmental Protection
BWP SW 36 Major Post-Closure Use Permit Application**

for

1.59 Megawatt Solar Photovoltaic Installation

Acton Landfill

Town of Acton, Massachusetts



**Submitted by:
Ameresco, Inc.
111 Speen Street, Suite 410
Framingham, MA 01701**

Prepared By: *amec*
**AMEC Environment and Infrastructure, Inc.
June 1, 2012**

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Application Submitted on June 1, 2012

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Post Closure Use Permit Application - Acton LF-arm-rjb.doc C:\Documents and Settings\robert.bukowski\Local Settings\Temporary
Internet Files\Content.Outlook\1P91C4724\Draft BWP SW 36 Post Closure Use Permit Application - Acton LF-arm.doc

EXECUTIVE SUMMARY

The Project

- ❖ Ameresco, Inc (Ameresco) is proposing the installation of a 1.59 megawatt (MW) solar array on the Town of Acton owned landfill located at 14 Forest Road in Acton, Massachusetts.

The Landfill

- ❖ The landfill occupies approximately 17.5 acres of town owned land.
- ❖ The property has been owned and operated as a landfill since 1927. From 1927 until 1969, the Acton Landfill was operated as a burning dump. Beginning in 1969 until its closure in 1985 the Landfill was used as a municipal landfill for sanitary municipal solid waste and industrial waste.
- ❖ Current site operations include an active refuse transfer station, recycling center, and a Department of Public Works (DPW) garage.
- ❖ The original landfill cap design (described from the bottom to the top) consists of 6-inch daily cover layer, 12" impervious cover, and a 6-inch vegetative support layer.
- ❖ Long term monitoring indicates that site conditions are stable. No letters of non-compliance have been identified as being issued by the Massachusetts Department of Environmental Protection (MassDEP) at the landfill.

The Solar Array

- ❖ 6,384 Photovoltaic (PV) modules.
- ❖ 28 modules per rack.
- ❖ Each rack will have two series strings of 14 modules. Each string will be run in parallel via exposed cables back to one of 34 combiner boxes. Each combiner box will be run in parallel back to one of three inverters, each with a dedicated transformer. All wiring will be run above ground either in conduit, or exposed, secured to the PV mounting system.
- ❖ The solar array is expected to be in operation in 4th Quarter 2012.
- ❖ (3) inverter/transformer skids - each with (1) inverter, (1) transformer, and ancillary equipment.

Project Impacts

- ❖ The project will impact limited portions of the vegetative layer of the landfill cap. The impacts will result from rack ballast installations. The impacts would be limited to removal of vegetation and topsoil for placement of foundation blocks.
- ❖ Results of Geotechnical Evaluation:

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- The modules, ballasts, and footings do not exceed loading criteria for the landfill.
- The solar array will not cause adverse landfill settlement.
- ❖ Results of Stormwater Evaluation:
 - The small increase in impervious area produced by the project has a negligible effect on stormwater runoff rates. Since the existing gravel access road on the north portion of the landfill will be covered with vegetation, the volume and rate of stormwater runoff will decrease slightly from existing to post-development conditions.
 - The peak discharge and runoff volume at the site decreased by 2.2% and 0.5%, respectively for the 25-year, 24-hour storm event.
 - No changes to the existing stormwater drainage systems will be required.
 - A stormwater and erosion control plan has been developed to mitigate any issues during construction.

Post Closure Environmental Monitoring

- ❖ The project will not increase the risk to human health and environmental risks.
- ❖ Regular monitoring will occur in the areas impacted by the solar arrays.
- ❖ The current environmental monitoring program will remain unchanged.

Regulatory Compliance

- ❖ The project is in compliance with MassDEP Solid Waste Management Regulations pertaining to Post-Closure Use of Landfills, 310 CMR 19.143.
- ❖ The project does not exceed Massachusetts Environmental Policy Act (MEPA) thresholds and is not subject to MEPA review.
- ❖ Wetlands are not impacted by the proposed project.
- ❖ Financial assurance requirements were addressed by the Town of Acton at the time the landfill was closed.

Comment [RJB2]: John – did Acton ever get back to you on whether grant money was used?

1.0 INTRODUCTION

1.1 PURPOSE

This BWP SW 36 Major Post-Closure Permit Application summarizes the impact related to the installation of a 1.59 megawatt (MW) solar array on the Town of Acton Landfill (landfill) located in Acton, MA. The application is pursuant to MGL C. 21A, ss. 2 and 8, and C. 111, s. 150A and 310 CMR 19.00. The application demonstrates that the proposed work will not result in adverse impacts to public health, safety, welfare, or the environment. The solar photovoltaic (PV) array installation adheres to the existing site closure and monitoring plans.

1.2 SCOPE OF WORK

The scope of work includes the installation of a 1.59 MWp PV array at the landfill. A summary of the work is as follows:

- Installation of 6,384 PV modules;
- The modules will be mounted in 4 x 7 sub-arrays with four ballasts per rack for a total of 912 ballast blocks;
- Installation of three inverters (500 kW each); and three 500kVA transformers.
- The modules will be connected using above grade cables in steel conduit run on concrete blocks or unistrut stands as applicable.

2.0 BACKGROUND INFORMATION

The background and historical information in this document is based entirely on the documents listed in Section 9.0. Many of the documents listed below are contained in the appendices of the documents listed in Section 9.0. The review of historical documents yielded information regarding the following:

- Post Closure Engineering Report (Camp Dresser & McKee Inc. (CDM), 2005)
- Closure Design Drawings (town of Acton Engineering Department, 1985)
- Post Closure Monitoring Plan (town of Acton Engineering Department, July and February 1985)
- Miscellaneous correspondence
- Previous BWP 36 Post-Closure Use Permit at the Acton Site (CDM, 2005)
- 2011 Annual landfill Inspection Report (CDM, 2011)

The landfill is adjacent to both Route 2 and Forest Road in Acton, Massachusetts (Middlesex County). The latitude and longitude of the site is 42° 28' 23" and -71° 25' 50". The landfill began as an open burning dump when the town purchased the original 4.4-acre parcel in 1927. In 1969, the town purchased 19.88 acres for Department of Public Works use (building and material storage) and for landfill expansion. In the mid-1960s, the burning dump was converted to a sanitary landfill. The site consists of approximately 35 acres of Town owned land of which approximately 17.5 acres is the landfill. The site plan provided in Appendix B depicts site features, topography, limits of waste, and proposed construction areas.

According to the CDM 2005 Post-Closure Use – Minor permit, the former Acton Landfill site operations include recycling, yard waste collection, and the stockpiling and storing of materials and recyclables. Two soil/clay stockpiles located at the top of the former landfill, is material to be used as shaping material to bring existing closure grades to the necessary post-closure grades. The area between the recycling area and the yard waste collection area is presently used by the town to store materials and equipment.

The Site topography generally slopes on all sides from the peak elevation of the landfill located towards the southeast corner of the site. The site is bordered on the north by large residential properties, to the west by woods, to the east by residential properties, and to the south by Route 2 and commercial properties.

2.1 SOLID WASTE SITE ASSIGNMENT

The use of the property as a landfill for disposal operations at the site predates 310 CMR 16.00. Based on a historic inspection record, the official assignment of the landfill was October 30, 1969.

In 1976, the town of Acton submitted plans for additional lifts to the existing landfill. The Massachusetts Department of Environmental Quality (MassDEQE, now Massachusetts Department of Environmental Protection (MassDEP)), approved the expansion plans.

In October 1980, the town submitted plans for expansion of the landfill. The MassDEP required the town install tests pits to determine groundwater elevations and subsurface conditions. The MassDEP approved the expansion on July 28, 1981 with the stipulation that the landfill be operated in conformance with 310 CMR 19.00.

In 1982, the town of Acton Board of Health approved the site assignment for a municipal transfer station at the site. In 1983, the town submitted plans for development of the transfer station, and in March 1984, the town submitted plans for expansion of the existing landfill. The MassDEP did not approve the plans due to lack of a groundwater monitoring program and landfill closure plans.

In September 1984, the MassDEP conditionally approved the landfill expansion plans and the transfer station contingent upon the town completing a study of the impacts of leachate generated from the site on the waters of Massachusetts, drainage ditches/swales, and a final closure plan of the landfill.

On February 5, 1985 and March 1, 1985 the town submitted a groundwater monitoring program and an update, respectively to study the impacts from the landfill on the surrounding areas. The program included four rounds of groundwater (upgradient and downgradient locations) and surface water (Bog and Clearview ponds, and Coles Brook) sampling the first year, and two rounds of

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sampling each year thereafter. The monitoring wells were installed up- and downgradient of the landfill and surface water samples were collected in Bog and Clearview ponds and Coles Brook.

The town submitted a Landfill Closure Plan and report to the MassDEP on July 15, 1985. The MassDEP replied indicating the closure plan and report were designed in accordance with 310 CMR 19.00, and approved the closure plans subject to several conditions including groundwater monitoring, slope, and drainage.

A July 22, 1986 report for a Septage Disposal Area Closure Plan at the town of Acton Septage Disposal Area indicated that septage sludge residue was used at the Acton Landfill site as final cover material supplement. Item #3 of the report states that two acres on the top plateau received most of the required impervious cover material but was not loamed and seeded. In all other areas (approximately 12 acres) landfill closure has been completed.

In a March 12, 1990 hand written MassDEP record of telephone conversation with the Action Board of Health regarding the closure and final capping. MassDEP indicated that the following items were still outstanding:

- Test pits to determine extent of cap in place
- Gas vents
- Cap remaining area
- Drainage ditch shown on plans needs to be installed
- Permeability data on capped area
- Long-term monitoring plan

In July 1994, the MassDEP indicated the town needed to perform landfill gas monitoring in addition to the groundwater monitoring.

In 1997, the town received a final permit (Permit BWP SW16 Transmittal #119242) from the MassDEP to operate the transfer station. In May 1999, the town received final permit (Permit BWP SW 07 Transmittal #201131) to increase the transfer station's capacity.

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In 2005, the town applied for and was granted a provisional permit for Post-Closure Use: Minor (BWP SW 37) to use the capped landfill area for recreational purposes (baseball diamond, soccer field, etc.).

Site closure information indicates the landfill is designated as a sanitary waste disposal site. Historical records indicate that a total of 467,000 cubic yards of material were disposed of in the landfill. According to Final Site Screening Inspection (NUS, 1991), most of the material deposited in the landfill was residential refuse, in addition to a relatively small amount of industrial solid waste. Since 1986, refuse has been received and temporarily stored in the transfer station prior to shipment to an offsite. The existing site conditions plan (CDM Sheet L-1 from the previous Post-Closure Use Permit) shows a recycling area which accepts scrap metal, glass, tin cans, newspaper, and yard waste to be composted (NUS, 1991), and a contains a storage and stockpile location.. As a result of this designation, the site assignment does not prohibit the proposed post-closure installation and operation of the PV arrays.

2.2 LANDFILL PROPERTY DEED

Comment [RJB3]: John – did Acton ever get back to you on this?

There are no limitations established for the property that constrain or preclude the proposed activity. Site impacts, as shown by stormwater runoff calculations and as further discussed in Section 5.0, are negligibly affected by the increased impervious area. In addition loading is within the acceptable limits of the landfill, as further discussed in Section 4.0, and all subsurface work will be performed with the appropriate due diligence such that it will not affect the impermeable clay liner.

2.3 ENVIRONMENTAL SITE ASSESSMENT

Post-closure monitoring of groundwater and surface water at the Acton Landfill has been conducted by the town since 1985. The town has continued its current groundwater and surface water sampling program as a post-closure monitoring program. Annual reports are submitted to MassDEP annually which summarize the sampling data collected from site monitoring wells and surface sampling locations.

Although the landfill has not undergone the official three-step solid waste landfill assessment as required by MassDEP and 310 CMR 19.150, the landfill has undergone assessment by the town and its consultants, and by the USEPA and MassDEP under CERCLA and the Massachusetts Contingency Plan (MCP) including:

- Final Report Ground-Water Resources Evaluation and Aquifer Protection Plan Phase II, for the town of Acton, Massachusetts (Acton Water District), Lycott Environmental Research, Inc. August 18, 1981. Based on information contained in this report and MassDEP records, this report confirmed the direction of groundwater flow to be southwest towards Cole's Brook, that leachate emanating from the landfill was not particularly strong and that it was intercepted by Cole's Brook and Clearview Pond; bedrock high to the southwest of Coles Brook is containing the leachate plume; leachate was being forced into Cole's Brook; and that the landfill was not a threat to the municipal wells.
- Acton Landfill Study, Goldberg-Zoino & Associates, Inc. (GZA) for the Acton Water District, June 1982. GZA concluded that the landfill was having an effect on the groundwater in the immediate vicinity of the landfill. GZA stated that the effects on surface water (Coles Brook) were modest and that the landfill was not the cause of some of the contamination showing up in municipal wells.
- GZA Letter report, 1983. This letter is referenced in MassDEP records, but was not found in the MassDEP files. The letter indicates that the leachate plume may be moving more directly south than originally thought; some of the contamination may remain as groundwater flow parallel to Cole's Brook; groundwater travel time from the landfill to Cole's Brook is approximately 5 years. GZA concluded that the only method of well contamination from the landfill would be induced infiltration at Fort Pond Brook to which, Cole's Brook is a tributary.
- Hydrogeology and Monitoring System Operation at the Forest Road Landfill, Acton, Massachusetts by Richard Cadwgan (consulting hydrogeologist), May 21, 1986. Mr. Cadwga identified the local hydrogeological conditions near the landfill, and outlined a monitoring program.

- Preliminary Assessment, NUS April 1987
- Final Site Screening Site Inspection NUS May 1991
- Final Site Prioritization Report for the Acton Landfill, Roy F. Weston, Superfund Technical Assessment and Response Team, April 1996.

In September 1999, the MassDEP and the USEPA stated that since the site was adequately regulated by the state's solid waste management program, and the data from historic sampling events suggest that remaining contamination in soil, groundwater, and surface water is at low levels, no further remedial action was planned or warranted under CERCLA/MCP.

2.4 CLOSURE PERMIT AND CLOSURE CERTIFICATION

Available MassDEP Correspondence can be viewed in Appendix A. In addition, the town submitted a closure plan in July 1985 as discussed in Section 2.1, and began groundwater and surface water monitoring. Monitoring was conducted the first year in July and October 1985 and January and April 1986 at nineteen locations to established background information for many parameters.

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3.0 PROPOSED PV SYSTEM INSTALLATION

Ameresco, in conjunction with the town of Acton, is seeking a Post Closure Use Permit in accordance with 310 CMR 19.000. Ameresco will construct a 1.59 MW PV system on the landfill cap.

The PV array will use polycrystalline PV modules, mounted on racks of 28 modules each. Four concrete footings will ballast and anchor each rack. Generally, the concrete footings will be placed parallel to the ground surface and set on a sand/aggregate layer which will be placed on top of the clay cap. The footing will be placed at varying slopes as necessary due to the topography of the landfill. The overall topography itself will not be altered significantly; however, fill will be placed in order to maintain allowable slopes for module installation. The modules will be mounted at a 25° angle in order to maximize yearly output and minimize wind loading.

The preliminary design drawings are included with this submittal. The following sections summarize the design approach.

3.1 PV ELECTRICAL GENERATION EQUIPMENT

The preliminary design will utilize 6,384 PV modules with 14 modules per string, and 152 strings per inverter. In total, there will be three inverters. Aside from the PV modules, the major site equipment includes the three transformers each of which are paired on a skid-mounted assembly with the three inverters and mounted on concrete slabs. Preliminary specifications are as follows:

Equipment	Specification	Count
Photovoltaic Modules	LG Solar LG250S1C	6,384
Inverter/Transformer Assembly	Advanced Energy Solar 500	3
Utility Grade Electric Meter	Schweitzer SEL-735	1
PV Disconnect Switch		4

Manufacturer's specifications and cut sheets for the Solar Panels and Inverter/Transformers can also be found in Appendix B.

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3.2 POLLUTION PREVENTION

This section is not intended to cover the Massachusetts Environmental Policy Act (MEPA) Review required under the BWP SW 36 Post Closure Use Permit requirements. The MEPA applicability review can be found in Section 7.0 Regulatory Compliance with backup detail and comments in Appendix E: MEPA Review. This section is intended to cover various environmental concerns that could arise from photovoltaic installations specifically. These items are as follows:

- Air emissions
- Noise
- Transient Lighting
- Glare

As power generation equipment is concerned, PV panels are extremely clean from an air emissions standpoint. There are no emissions of NO_x, SO_x, CO, CO₂, particulates or any other contaminants of concern.

The PV panels themselves do not make any noise, however each inverter and transformer skid package contains fans to keep the equipment within its required operational temperature range. The inverters themselves emit a buzzing sound unique to that type of equipment. These particular inverters will be mounted in the middle of the landfill and several hundred feet from the edge of the landfill property at their closest. The inverters have a sound level of 65 dB at 3 meters. The closest residential/commercial receptors are a couple of hundred feet beyond the landfill limits and sound attenuation will occur through the offsite vegetative buffer. See Appendix B for inverter sound level specifications.

Transient lighting, from security lights located on the landfill fence, will be motion sensor activated. Often these lights can be activated by waving branches or other nearby disturbances caused by wind or animals. A regular occurrence of accidental activation is not an issue as trees and woody vegetation are not permitted (nor located) on the landfill.

Comment [RJB4]: John – is any lighting proposed?

PV panels are designed to absorb as much light as possible in order to increase the efficiency with which the photocells convert solar radiation into electricity. In addition, at this particular site the landfill is the highest local geographical feature in the area and the panels will be oriented towards the southern sky at a 25 degree angle. Two glare studies detailing the minimal impact of the solar modules accompany the MEPA review in Appendix E. Both studies generally address the subject of glare, they are not site specific. The first study was performed by a PV module manufacturer the second by the Federal Aviation Administration.

3.3 SITE DESIGN

The site design of the solar array is included in the Drawings. Solar arrays supply DC power to inverter/transformer pads as shown on the Drawings. The inverters will be mounted at grade on a concrete pad and connected in parallel with a transformer.

The mounting racks are placed both on the northern flatter area of the landfill as well as on the southern slope of the landfill. Stormwater control features include drainage structures within the existing recycling area northwest of the array and a stormwater basin to the north of the array. The existing elevation and grade of the landfill will be modified slightly to accommodate the array's maximum allowable slopes. The existing on-site clay material will be used up to a maximum thickness of 1-foot. Additional off-site fill material will be required for the southern slope.

3.4 EQUIPMENT MOUNTING

As discussed in the previous section, each rack assembly will hold 28 PV modules in a 4 x 7 formation. The proposed Site Plan consists of a total of 288 racks, with four ballasts per rack, for a total of 912 ballasts. Installation of the ballasts may require some minimal excavation that would not extend past the 6" loam layer. The sizes of the precast concrete ballasts are 8.5 feet by 4 feet and 1.5 feet thick.

The ballast design is required to balance several competing variables. First, the footings must be heavy enough to prevent moving or tipping due to wind, snow or ice loads. Second, the footings must not transfer too high of a load to the cap in order to minimize potential settlement. Third, the

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surface area of the footings must be small enough to minimize changes to the stormwater control system due to the increase in impervious area.

The design wind speeds and snow loads can be found in Appendix D. A 110 mile per hour wind load was used in the loading in accordance with State Building Code.

The rack that provides the 4x7 module arrangement is manufactured by SolarFlex Rack. Based on the loading calculations, which can be found in Appendix D, this ballast foundation provides adequate protection from moving or tipping as long as the ballasts are mounted level, on a slope no greater than a maximum of 14 percent incline (8 degrees). See the Array Layout drawing for the constraint and layout plan.

The allowable bearing capacity from ballast loading was determined to be 750 pounds per square foot (psf). This will prevent damage to the landfill cap and minimize potential future settlement of the cap due to the proposed solar arrays. This takes into account the specifications of the existing cap design installed at the site. The loading resulting from the installation takes into account the load coming from the modules, rack, footings, as well as any lateral and overturning loads caused by wind. See Appendix D for calculations related to loading.

The footings themselves do not cause an increase in stormwater runoff. See Section 5.0 for the stormwater discussion and refer to the stormwater modeling results in Appendix C. The proposed array design avoids construction in the primary swale running through the landfill. It also does not overlay any of the swales running along the perimeter of the cap or affect the runoff to those swales. The modules and the associated racking will be approximately 7.5 feet in height in the rear and 2 feet in height in the front. This height, taken with the 25 degree mounting angle of the modules will allow for continued vegetative growth on the cap. Details of the racks can be found in Appendix B.

Comment [RJB5]: John – do you have cut sheets on the racks and panels?

3.5 CABLE CONDUITS

Low voltage cable conduits will be mounted on the rack assemblies of each array. As the conduits run between arrays and traverse the landfill to the inverters, they will be installed above grade mounted to the back of the array ballasts and on concrete and unistrut supports as applicable.

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High voltage cable conduits will be encased in concrete per NEC code and buried as shown on the Proposed Conduit Details provided in Appendix B. High voltage cable will run from the transformers to the utility connection. See the Site Plan and Detail drawings at the end of the report for more detail.

Comment [RJB6]: John – how do you propose the run from the transformers to the pole?

3.6 ARRAY AREA

The total area of PV modules is approximately 109,520 square feet, or 2.51 acres. The racks will be oriented linearly across the landfill in an east/west direction. The north/south distance between each edge of linear set of racks will be between approximately 6 feet 6 inches and 16 feet 8 inches depending on the localized slope of the landfill

3.7 CONSTRUCTION/CONSTRUCTABILITY

Prior to construction, means and methods will be reviewed with the installation contractor. Means and methods will identify the construction approach, phasing, construction equipment, resulting transient loading, and potential scenarios that might result in damage to the landfill cap. A procedure for repairing damaged areas of the landfill cap will be developed. Any damaged vegetation will be replanted. Any ruts will be repaired. From a preventative standpoint, there will be restrictions on depth of rutting as well as weather and cap conditions.

3.8 PROJECT SCHEDULE

The following table is the project milestone schedule for the Acton landfill PV project. This schedule assumes an accelerated application and permitting process through the MassDEP.

Project Milestone	Completion Date
Interconnection Application Filed	May 1, 2012

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Town Acceptance	---
BWP SW 36 Post Closure Use Permit Award	---
Local Permit Award	June 30 th , 2011
Interconnection Agreement Signed	??
Start of Construction	September 1, 2012
Final Commissioning and Operations	March 30, 2012

Comment [RJB7]: John – any confirmation from Acton that no other permits are required?

This schedule is contingent upon weather and the availability of all materials including the modules, rack assemblies, and footings.

3.9 LANDFILL MAINTENANCE AND ENVIRONMENTAL MONITORING

It is the intent of the project to not change or disrupt the existing long term monitoring and maintenance activities at the landfill.

The landfill maintenance currently consists of annual inspections performed by CDM. CDM submits a report of any items of concern to MassDEP. The landfill cover is mowed annually to prevent any woody vegetative growth. The sediment build-up in the detention basin is also monitored removed as required.

Environmental monitoring at the site encompasses groundwater and surface water monitoring. Groundwater monitoring, in accordance with 310 CMR 19.132, occurs annually for 30 years after closure or until the landfill no longer poses a threat to public health, safety or the environment, as determined by MassDEP. In accordance with this regulation the Town submits a post-closure summary report to the MassDEP every two years. This report summarizes the results of the environmental monitoring programs.

There are 8 groundwater monitoring wells on-site. The wells are monitored and analyzed for the following parameters:

In-Situ Parameters

- pH
- Static Water Level

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- Temperature
- Specific Conductivity

Laboratory Analyses Performed

- Alkalinity (SM2320 B/E310.1)
- Mercury (E245.1)
- Chloride (ASTM D512/E300)
- Sulfate (E300)
- Ammonia (E350.1/E350.3)
- Nitrate (SM4500-NO3 D/E300)
- Total Dissolved Solids (SM2540C/E160.1)
- Sodium (E200.7)
- Purgeable Halocarbons (E601/E524.2)
- Purgeable Aromatics (E602/E524.2)
- ICP Metals (E200.7)

No landfill gas monitoring program is in place and the town has not collected soil gas data. However, since the landfill has been closed for more than 20 years, implementation of a post-closure soil gas monitoring program is not planned. According to the 2011 Annual Landfill Inspection Report prepared for the Town of Acton, Massachusetts by CDM, dated September 2011, several areas were identified that required attention. MassDEP requested that methane measurements be taken to assess whether areas of limited vegetation were caused by the presence of methane. AMEC performed an on-site methane survey of these areas, which is summarized in Section 6.0.

3.10 INTERCONNECTION

Ameresco has applied to NSTAR, the local electrical utility, for an interconnection agreement based on the "Interconnection Tariff MDTE 162B." The interconnection agreement primarily addresses the following three issues:

1. Distributed generation (DG) operation does not cause harm or damage to the utility.

2. DG operation does not cause problems for other customers on the NSTAR distribution system.
3. Safety of personnel and the public is not jeopardized by the operation of the DG.

Applications can be filed under either the Expedited or Standard Interconnect Process. The expedited process was chosen based on project schedule outlined above. Under the expedited process NSTAR will determine if any studies are required within 25 days. If no studies are required, NSTAR will send the interconnection agreement to Ameresco. If a study is required the maximum time it will take to receive the interconnection agreement from the time of file is 60 days.

3.11 SITE OPERATIONS AND MAINTENANCE PLAN

As described in Section 3.2 each rack of 28 panels will have 2 circuits. This allows for individual rows of modules to be disconnected for maintenance or repair while minimizing the effect to the overall electrical generation capacity.

Ameresco understand the critical nature of the monitoring and maintenance as it pertains to the overall landfill and PV array operations. An affiliate of Ameresco will provide the following services as part of a 10-year Operations & Maintenance Proposal:

- Annual Preventive Maintenance Services
- On-site inspection of all system components including controllers, panels, tracking system, conduit, wires, and all other components of the solar energy system to assess the health of the PV system and baseline system performance
- Mechanical and electrical checks including:
 - Testing of each string for current flow and voltage
 - Spot check for electrical grounding continuity between the PV modules and the tracking system
 - Spot check and repair MC connections
 - Spot check for corrosion between copper wires, PV modules, and racking systems
 - Spot check plastic wire ties and any isolation material that protects wiring from sharp, metal edges
 - Inspection of inverters
 - Lubrication as necessary of tracking system components

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- Inspection of flexible conduit and homerun wires between the moving PV modules and the stationary posts for wear due to cycling motion and replace if necessary.
- Solar Monitoring & Metering Preventive Maintenance including:
 - On-going 24/7 active solar monitoring to identify outages and performance issues, enabling dispatch repair services as required
 - Annual inspection meter wiring will be checked for signs of corrosion or other wear
 - The revenue meter and meteorological station will be serviced every five years. In addition, the meter battery will be inspected and replaced if necessary, and the meteorological sensors will be inspected and moving parts will be replaced
 - On-line secure portal providing real-time energy generation data and emission savings information
- Panel washing and vegetative removal
- Maintenance and repair of site security including permanent fencing around the perimeter of the site, motion sensor lighting, and cameras
- Warranty claims on PV panels, rack assemblies, and inverter/transformer skid

Other site operations and maintenance activities such as stormwater basin maintenance and cap inspections will be able to continue on the same intervals and to the same level of quality as they were performed prior to the PV system installation.

3.12 SITE SECURITY

Site security will include a continuous chain link fence supplemented by cameras and motion sensor lighting. At any locations where the chain link fence is within the limits of the landfill cap, the installation of the fence posts will be ballasted to prevent puncturing of the clay liner. Final layout and equipment specifications will be made as part of the final design, prior to the start of site construction.

3.13 SITE DECOMMISSIONING

In the event of the need to decommission and vacate the site a decommissioning plan has been written into the lease agreement between the Town of Acton and Ameresco.

4.0 GEOTECHNICAL EVALUATION

4.1 LANDFILL CAP MODIFICATIONS AND STRUCTURE LOADING

4.1.1 Existing Cap Construction, Proposed Modifications and Material Properties

Based on the detail plan from the "Forest Road Sanitary Landfill Closure Plan" (Town of Acton Engineering Department, July 15, 1985), the final cover system at Acton Landfill consists of the following materials from the ground surface downward:

- Loam, 6 inches minimum
- Impervious cover (clay), 12 inches minimum
- Daily cover material, 6 inches minimum
- Landfill waste

The thickness of the waste at Acton Landfill is unknown. However, the toe of the landfill is approximately at elevation 190 feet and the surrounding topography seems to be level at about this elevation. Therefore, for the purposes of our evaluations, it was assumed that elevation 190 feet is also the bottom of the waste.

No information was available regarding subsurface conditions below the landfilled waste. The US Geological Survey (USGS) indicates that the surficial geology of the area consists of swamp deposits comprised of organic muck and peat with minor amounts of sand, silt and clay. Most of these deposits are less than 10 feet thick.

4.1.2 Proposed Regrading

Construction of the solar array panels will require regrading of the landfill surface to reduce the slopes for the ballast systems, particularly along the south slope. The maximum acceptable slope for the panels and ballasts is 14 percent. In general, 6 inches to 2 feet of fill will be placed on the

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landfill surface, with some localized areas receiving as much as 4 feet. The south slopes will require up to 7½ feet of fill in some areas to bring the slopes to within the maximum acceptable grade limit of 14 percent (8 degrees).

The loam will be stripped from the landfill surface and replaced with granular fill. A 10 to 12-foot high stockpile of clay material is currently located on the eastern portion of the landfill. It is unknown when the stockpile was placed on the landfill, however it was present during a 2005 topographical survey. Test pits were performed in 2012 and geotechnical laboratory tests were conducted to determine the suitability of the clay for use as fill to regrade the landfill. The results of the testing are located in Appendix F. The stockpiled material encompasses an area approximately 280 feet by 100 feet is intended to be used as general fill across the landfill surface and not along sideslopes. The recommended maximum placement thickness for the clay is 12 inches, and it is expected that final grading will be done through placement of granular material above the clay fill. Removal of this stockpile represents a significant area of surcharge unloading.

4.1.2 Structure Loading and Material Properties

Each solar panel group is approximately 26.6 ft long and 13.2 ft wide, as shown on the Drawings. The panels are supported by 3 concrete ballast blocks. Each ballast block is 12.5 feet long, 3 feet wide and 1.5 feet thick and will be placed directly on the final grade surface. The panels are placed side by side, such that each block is spaced 14 feet on center; end blocks of adjacent panels are spaced 11 feet apart.

Based on information provided by Solar FlexRack, ballast loading will consist of the following:

- Minimum bearing pressure (Case A, wind from the north): 225 psf
- Maximum bearing pressure (Case B, wind from the south): 388 psf

The following material properties were used in the analyses. As noted, these properties were assumed based on literature values or developed from laboratory testing.

Granular Fill:

- Assumed unit weight, $\gamma_t = 125$ pcf; (assumed based on typical values found in literature)

- Internal friction angle, $\phi = 32$ degrees; (assumed based on literature values)

Clay cap

- $\gamma_t = 122$ pcf ; (based on 92% of maximum dry density as determined by ASTM D698, Standard Proctors, as conducted on stockpile material)
- Cohesion, $C = 1,000$ psf ; (assumed based on controlled placement during construction)

Waste

- $\gamma_t = 40$ pcf; (assumed from literature, "Geotechnology of Waste Management", Issa S. Oweis, Raj P. Khera, 1990)
- $\phi = 16$ degrees; (average value assumed from literature; Oweis and Khera, 1990)
- $C = 835$ psf; (average value based on literature, "Geotechnics of Waste Fills", Landva/Knowles ASTM STP 1070, 1990)

4.2 BEARING CAPACITY

The allowable bearing capacity of the supporting soils was estimated and compared to the maximum anticipated bearing pressures from the solar panels. The ballasts will be supported on a layer of granular fill used to replace the stripped topsoil or to regrade the surfaces and slopes. The granular fill will be of varying thickness. The Meyerhof method was used to calculate the ultimate bearing capacity (Bowles, 1982). The bearing capacity is based on the ballast width (3 ft) and is independent of the ballast length (12.5 ft). A safety factor of 3 was then applied to determine the allowable bearing pressure. The Meyerhof method makes allowances for shape, depth and inclination of the load. The inclination factor is applicable to assess bearing capacity along sideslopes where ballasts panels will be placed.

Bearing capacity was analyzed for both the north slope (vertical loading) and the south slope (inclined loading) assuming the ballasts would be supported on 1) granular fill, or 2) the clay cover. Because the fill layer may be thin and the clay cap layer is relatively thin (12 inches), the bearing capacity of the waste was also analyzed to rule out punching failure.

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Based on a footing width of 3 feet and the above loading conditions, the maximum allowable bearing pressure is estimated to be 750 psf.

Detailed bearing capacity calculations can be found in Appendix D.

4.3 SETTLEMENT

Settlement was evaluated in consideration of loading from fill and loading from the panels and ballasts. Settlement of the fill and clay cap is assumed to be negligible because of the controlled placement of both materials and because the settlement will occur almost immediately. Only settlement of the waste due to the imposed loads was analyzed.

For the settlement calculations, a bottom of waste elevation of 190 feet was assumed which results in a waste thickness at the center of the landfill of about 26 feet and a waste thickness of 6 feet in areas along the south slope where fill placement is proposed to be highest.

The depth of loading influence (bearing capacity and settlement) for the ballasts is expected to range between two and four times the ballast width, or between 6 feet and up to 12 feet below the surface. The Boussinesq method was used to determine the vertical zone of influence for the solar panel and ballasts; this loading can extend to a depth of 4B or 12 feet. Because the fill is placed on a large area, it was assumed that 100 percent of the load was applied through the entire depth of the waste.

Settlement of waste within a landfill generally occurs from one or more of the following:

- Primary settlement from surcharge loading;
- Primary settlement from compression of waste due to self weight of the waste;
- Movement of finer particles into voids within the waste; and
- Volume changes from biological decomposition and chemical reactions.

Solar panels and ballasts and fill placement would be considered surcharge loading. Settlement from self-compression, movement of finer particles into voids, and biological degradation would be unaffected by the surcharge loading. Topographic survey data was collected in 2012, 2005 and

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prior to 2005 (provided by Town of Acton, date and Surveyor information unknown). Review of the survey data presented on the cross sections as settlement exhibits in the Drawings, indicates that the landfill generally exhibited about 1 to 2 feet of settlement from the first survey (presumably at the end of construction) until 2005. Between 2005 and 2012, about 0.5 to 1 foot of settlement has been recorded.

Settlement was calculated at the landfill surface and the south slope of the landfill. To estimate primary settlement in the waste, it was assumed that the zone of influence for the fill material loading would extend to the assumed bottom of waste. Primary settlement was estimated using consolidation theory typically applied to clay materials (Oweis and Khera, 1990). An average compression ratio for the waste, CR, of 0.23 was assumed.

The estimated maximum post-construction settlement under the centerline of the ballasts is as follows:

Landfill Surface (based on 26 feet of waste)

- In areas of where 2 ft of fill is planned:
 - Settlement due to fill (assume 2 feet): 8 ¾ inches
 - Settlement due to ballast loading: 3 inches
- In areas where 0.5 ft of fill planned:
 - Settlement due to fill (assume 0.5 feet): 2 ½ inches
 - Settlement due to ballast loading: 2 inches

South Slope

- Settlement due to fill (maximum 7.4 ft): 9 inches
- Settlement due to ballast loading: 1/4-inch

These settlement estimates reflect long-term amounts that will occur over several years. The settlement estimate for the landfill surface is based on average fill conditions along the surface of the landfill and not the smaller, isolated areas of thicker fill. The area under the 12-foot high stockpile of clay has essentially been pre-loaded to much higher stresses and will likely not experience additional settlement from the fill or ballast loads. The “pre-loaded” zone extends

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beyond the footprint of the stockpile and will contribute to reducing post-construction settlement in those regions of the landfill. This zone is shown on the Drawings. This may result in areas of differential settlement and the ballasts should have the means to shim over time. Settlement along the south slope was based on the maximum anticipated fill loading. Differential settlements between ballasts are dependent on waste characteristics, which can be highly variable.

Detailed settlement calculations can be found in Appendix D.

4.3 STABILITY

4.3.1 South Slope Stability

Solar array panels will be placed along the south slope; some areas on the south slope will require over 7 feet of fill to flatten the slopes to acceptable grades for the panels. Stability of the fill material with ballast surcharge loading was evaluated at the approximate worst case section between Profiles D and E at the southeast corner of the landfill. The evaluation was made utilizing SLOPE/W (GeoStudio 2004, Version 6.22), an industry-standard two-dimensional slope stability software program developed and distributed by Geo-Slope International, Ltd. The Spencer Method was used in the evaluation, which satisfies moment and force equilibrium.

The minimum acceptable Safety Factor (SF) applied is dependent upon the risks and implications of failure, as well as the confidence or uncertainty, in the definition of existing conditions (e.g., topography, subsurface soil and groundwater conditions, etc.), in addition to the proposed changes in those conditions (e.g., temporary excavations, long-term re-grading, etc.). For most embankments, a minimum SF of 1.5 is considered acceptable for long-term static stability under normal loading conditions; this minimum SF is typically required by the majority of state and federal regulatory agencies for embankments where personal and/or environmental safety is a concern. For the purposes of this evaluation, a minimum acceptable SF of 1.5 has been assumed.

The assumed bottom of the waste (elevation 190 feet) was used for the bottom of the expected failure surfaces. No information is available regarding site-specific subsurface information, therefore none of the analyses represent overall global stability of the landfill; stability was only assessed within the fill and assumed waste zone.

Both shallow failure surfaces in the fill and deeper failure surfaces in the waste were considered. Additionally, the interface between the granular fill and clay cover was evaluated using a specified slip surface. A ballast surcharge load of 388 psf was applied to the surface of the slope. The analysis geometry is included in Appendix D.

Based on the above assumptions and loading conditions, and the material properties identified in section 4.1.2, the minimum computed SF was 1.9 and occurred along the 3 horizontal (H) to 1 vertical (V) portion of the slope. The minimum SF computed along the interface between the fill and the clay cap was 2.8.

Detailed calculations are presented in Appendix D.

4.3.2 Interface Stability

The stability of the interface between the precast concrete ballasts and the granular fill surface was evaluated for sliding. The steepest design slope is 14 percent or 8 degrees. Using infinite slope methods, the minimum SF for sliding of the ballast is 2.6, which is greater than the minimum acceptable SF of 1.5.

Detailed calculations can be found in the Appendix D.

5.0 STORMWATER EVALUATION

5.1 STORMWATER MODELING

The stormwater run-off pattern for the Acton landfill will not be altered for this post closure use. The current stormwater management system consists of a stormwater basin to the north of the landfill. Runoff from a portion of the landfill is directed to this basin however the majority of the landfill runoff flows off-site to the south and east. The basin also collects runoff from a portion of the D.P.W. parking lot and the transfer facility. It is unknown what design criteria was used for the original design of the stormwater management system.

For this project, runoff calculations were performed for a Type III 25-year 24-hour storm event. The rainfall is 5.31 inches for the 25-year event (National Weather Service Technical Paper 40). The stormwater evaluation indicated minimal impact to the stormwater system due to the proposed PV project. The results of this evaluation are outlined below. In addition, a 100-year, 24-hour storm event (6.44 inches of rain) was also evaluated and also indicated negligible impact to the stormwater system.

The existing condition peak-design flows were determined using the National Resources Conservation Service (NRCS) Technical Release 55 (TR-55) methodology. The post closure conditions imposed by the PV arrays were also modeled using the NRCS TR-55 methodology. HydroCAD modeling software was used. HydroCAD is industry accepted modeling software that utilizes the TR-55 methodology.

The existing conditions survey performed by AMEC in March of 2012 was used to develop the stormwater model. There were two scenarios evaluated. The Existing Condition (pre PV array development) and the Proposed Condition (post PV array development). The detailed stormwater models and rainfall distribution and intensity maps can be found in Appendix C.

The primary effect of the PV arrays on stormwater runoff rate and volume will result from the ballasted portion of the rack assembly. There will be a total of 243 panel rack assemblies. Each of these rack assemblies will require three ballast blocks to anchor them to the ground. Each of the

ballast blocks are 3 feet wide by 12.5 feet long. The effective impervious area created by each panel array is 112.5 square feet. In addition to the ballasts required for the PV arrays, three proposed inverter/transformer pads will each convert 281 square feet of pervious cover to impervious cover. There are areas of the site that are currently used as vehicle and equipment storage areas. These areas have dense graded gravel as a surface cover. With the exception of the ballast blocks and inverter/transformer pads, all disturbed areas will be planted with vegetated ground cover. As a result, areas that were previously covered in gravel will now be vegetated thereby reducing the resulting runoff volume. While the PV arrays have a large surface area, any stormwater that lands on these surfaces will run off onto the permeable vegetative layer of the landfill cap.

The impervious cover associated with the ballast blocks and transformer pads accounts for approximately 6% of the affected catchment area. The affected catchment areas drain to either the existing detention basin or off-site to the south and east. The detention basin to the north of the landfill captures runoff from approximately one fifth of the affected area. The existing stormwater detention basin discharge occurs through both infiltration and pipe discharge. The NRCS Web Soil Survey indicates that the basin is located in an area of sandy soils. The discharge pipe from the basin is connected to the stormwater system for the transfer station. During intense storm events, overflow from the basin occurs over the northeast lip of the basin toward the on-site isolated wetland area. Table 5.4 provides a summary of the potential impact to the existing pond which is minimal.

The following tables are the results of the stormwater modeling for existing and post closure use scenarios as well as the percent increase in peak runoff rate and volume.

Table 5-1: Ballast Footprint by Catchment Area

Catchment	Ballast Count	Ballast Area ²	Catchment Area
Number	No.	Acres	Acres
1	0	0.000	1.008
2	91	0.078	1.855
3	20	0.017	0.409
4	232	0.200	2.303
5	33	0.029	0.563
6	274	0.235	3.033
7	6	0.006	0.703
8	73	0.063	2.301
Total	729	0.628	12.175

¹Array and ballast count for each catchment is approximate to within 3%. Locations may shift slightly during construction and arrays may straddle catchment boundaries.

²Ballast foot print is 150 inches by 36 inches

Table 5-2: Existing Conditions

Catchment	Rainfall Runoff	Rainfall Runoff	Time of Concentration	Peak Flow ¹
Number	Inches	cubic feet	minutes	cubic ft / second
1	1.26	4,617	33.7	0.81
2	3.53	13,460	10.0	3.93
3	3.93	14,636	18.9	3.34
4	3.53	32,104	11.2	9.08
5	3.33	6,316	16.4	1.58
6	3.32	36,721	26.5	7.54
7	3.33	9,322	12.6	2.55
8	3.43	26,964	15.8	6.79
Total	N/A	144,140	N/A	N/A

¹Peak flow for the site does not equal the sum of the individual catchment flows due to varying times of concentration

Table 5-3: Proposed Conditions

Catchment	Rainfall Runoff	Rainfall Runoff	Time of Concentration	Peak Flow ¹
Number	Inches	cubic feet	minutes	cubic ft / second
1	1.26	4,617	33.7	0.81
2	3.52	22,608	24.5	4.76
3	4.03	5,968	29.2	1.13
4	3.41	28,532	33.6	5.24
5	3.33	6,795	17.2	1.66
6	3.43	37,767	15.0	9.70
7	3.34	8,538	10.3	2.49
8	3.43	28,662	11.5	8.08
Total	N/A	143,487	N/A	N/A

¹Peak flow for the site does not equal the sum of the individual catchment flows due to varying times of concentration

Table 5-4: Existing Stormwater Retention Pond Summary

Storm Event	Existing Condition	Proposed Condition
	Water Elevation	Water Elevation
25	184.74	184.71
100	185.19	185.19

Notes: Top of pond elevation is elevation 185
 An assumed infiltration rate of 8.27 inches/hour was used in the evaluation.

Table 5-5: Analysis Point Comparison - Existing vs. Proposed Conditions

25-Year Storm Event	Existing Condition Peak Flow (cfs)	Proposed Condition Peak Flow (cfs)	Difference (cfs)
Detention Basin Inflow	7.24	6.63	-0.61
Detention Basin Outflow	4.82	4.78	-0.04
Off-Site Flow	25.01	24.45	-0.56
100-Year Storm Event			
Detention Basin Inflow	9.29	8.64	-0.65
Detention Basin Outflow	9.82	9.31	-0.51
Off-Site Flow	32.06	31.35	-0.71

For the 25-year 24-hour storm, the peak flow to the detention basin decreased by 0.61 cubic feet per second. The peak flow for the outlet pipe of the basin decreases by 0.04 cfs. The total runoff volume for the site decreased by 653 cubic feet, which is proportional to the peak flow decrease. The additional runoff to the detention basin will decrease the peak storage elevation from 184.74 feet above the bottom elevation to 184.71 feet. The peak elevation in the pond will decrease by less than a half inch over existing conditions and is well within the capacity limits of the detention basin.

In addition, a Type III 100-year, 24-hour storm event was modeled to assess the potential for off-site flooding. Peak inflow to the detention basin under this scenario is 9.29 cubic feet per second under existing conditions. This will decrease to 8.64 cubic feet per second as a result of the post closure development. The peak discharge rate through the detention basin outlet pipe will change from 9.82 cubic feet per second to 9.31 cubic feet per second. The overflow weir for the basin will be used during the 100-year storm event. The volume of runoff discharged over this weir will increase from 0.041 acre-feet in the existing condition to 0.042 acre-feet in the proposed condition. This increase, 0.002 acre-feet, will not create a flooding impact of the downstream wetland. Peak

flow off-site for the 100-year storm will be reduced from 32.06 cubic feet per second to 31.35 cubic feet per second. The calculations for the 100-year storm can be found in Appendix C.

The information above demonstrates that the proposed modifications will not increase runoff volume or peak flow rates for the 25-year and 100-year 24-hour storm events.

5.2 STORMWATER EROSION CONTROL PLAN

Section 6.4 addresses the requirement for a Stormwater Erosion Control Plan to be implemented prior to and during construction. This plan will address all potential avenues and pathways for erosion during construction and operation. This section briefly describes what the erosion control plan will encompass.

The primary construction activities that the plan will address will be the stripping of soil and vegetative material within the limit of disturbance, the addition of fill material to achieve satisfactory slopes for the installation of the solar array, the movement of heavy machinery, and re-vegetation of disturbed areas. Vegetative cover outside of the limit of disturbance is to remain. The existing clay pile will be used as fill material on the flatter portions (less than 5 degrees (8.8%)) of the landfill as described in Section 4.0. If the vegetative cover outside the intended work area is damaged or disturbed during construction, it will be repaired to re-established vegetation. The types and locations of machinery will be dictated by the constructability assessment discussed in Section 3.7 and completed prior to the commencement of construction. Vegetation will be restored up to the edge of each ballast block. Material stockpiles will be maintained in one or more central locations. Perimeter erosion control will be placed around all stockpiles and will consist of sediment fence and/or haybale dikes sufficient enough to contain sediment. In addition, stockpiles will be covered with a tarp during non-working periods and during rain events.

Disturbance of the landfill surface and access road by equipment is another possible source of erosion during construction. Rutting or exposed soil will require repair and attempts to mitigate future rutting at the same location will be made. The constructability plan will assess the weather conditions that would permit work on the site. Avoiding site work on the cap during periods of

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heavy precipitation or when the cover soils are saturated and soft should mitigate many of the issues related to equipment use at the landfill.

The lower edge of each panel array, or the “drip edge”, has been identified as a potential source of ongoing erosion. This is not likely to be an issue due to the relatively short drip distance, flat slope of the landfill and the well-established vegetative cover. If erosion along the drip edge becomes an issue it will be mitigated as part of ongoing maintenance at the landfill, likely with a gravel splash strip.

As noted on the Drawings, any erosion and sediment control measure will not be allowed to penetrate into the clay cap material.

6.0 ON-SITE METHANE SURVEY

6.1 BACKGROUND

The 2011 Annual Landfill Inspection Report prepared for the town of Acton, Massachusetts by CDM, dated September 2011 identified areas where attention may be needed. DEP requested that methane measurements be taken to assess whether areas of limited vegetation were caused by the presence of methane. These areas were designated as "C" and "D" in CDM's report.

6.2 FIELD INVESTIGATIONS

On May 29, 2012 AMEC used a flame ionization detector (FID) to check for the presence of methane. The FID was calibrated using a carbon filter and 100 ppm (parts per million) methane span gas.

Background readings were taken at the site, both at locations approximately 60 feet away from areas "C" and "D", as well as at breathing height (approximately 5.5 feet above ground surface). Background readings were 0 ppm.

Area "C" was observed to have some bare spots without significant vegetation. A reading of 0 ppm was taken at breathing height. Readings at the ground surface fluctuated between 0 ppm and 20.0 ppm for several minutes with occasional readings reaching a maximum of 31.9 ppm.

Area "D" also still had some bare spots. Readings of 0.0 ppm were taken both at the ground surface and breathing height.

6.3 SUMMARY

One of the areas of concern ("D") showed non-detect (0 ppm) levels of methane, and the second area of concern ("C") showed methane levels between 0 ppm and 31.9 ppm (0.24%), well below the Lower Explosive Limit (LEL) of 5%. Based on these measurements, methane is not expected to be a concern during construction.

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7.0 REGULATORY COMPLIANCE

7.1 MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MEPA thresholds can be found in 301 CMR 11.03. All MEPA thresholds were reviewed within the context of the post-closure use for applicability. The findings are detailed in Appendix E. The findings, which are a point by point review of the MEPA thresholds, indicate that no thresholds will be exceeded and therefore no MEPA review is required.

7.2 WETLANDS PROTECTION

AMEC conducted a wetlands investigation at the site on March 22, 2012. A wetland was found northeast of the toe of the landfill slope. This wetland is classified as an isolated land subject to flooding (ILSF) under 310 CMR 10.57 (1)(b). Under these regulations, the ILSF does not have a buffer zone. The ILSF will not be filled, removed, or altered either by construction activities or the installation.

Because no work is proposed within the wetland or its associated 100-foot buffer zone, filing with the Acton Conservation Commission is not required.

7.3 FINANCIAL ASSURANCE

Financial assurance requirements associated with post-closure maintenance and monitoring of the landfill were addressed by the Town of Acton during closure activities in accordance with 310 CMR 19.051. The post-closure use will not change any post closure activities. However, responsibility for performing many of the activities will change. It is anticipated that an Ameresco affiliate will be performing the maintenance of the solar arrays, mowing, and periodic inspections on behalf of the Town. The responsibility for monitoring and landfill maintenance will remain with the Town.

Comment [ARM8]: Did not find any indications that this was addressed by the town.

7.4 OTHER PERMITS

The National Pollutant Discharge Elimination System requires the filing of a Notice of Intent (NOI) if construction activities are expected to disturb greater than 1 acre of land. Construction activities are limited to the access roads, PV array locations, and any equipment staging are access ways. Solar array construction activities will disturb greater than 1 acre of land therefore requiring the filing of an NOI. The construction general permit will require a Stormwater Pollution Prevention Plan (SWPPP). These documents will be prepared as part of the site design and will be included in all contractor bid packages.

As discussed previously, construction will not take place within any wetlands or associated buffer zones. The River Protection Act is not applicable. The closest river and perennial stream is located at a distance greater than the 200 feet and would not trigger a NOI.

Building and electrical permits will be required by the Town under 780 CMR 110.1 and 527 CMR 12.00, respectively.

7.5 ENFORCEMENT STATUS

There are no outstanding enforcement actions.

8.0 ACRONYMS

CMR	Code of Massachusetts Regulations
DG	Distributed generation
kVA	kilo-Volt amperes
Landfill	Town of Acton Landfill
MassDEP	Massachusetts Department of Environmental Protection
MEPA	Massachusetts Environmental Policy Act
MW	megawatt
NEC	National Electric Code
NOI	Notice of Intent
PV	Photovoltaic
TBD	to be determined

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9.0 REFERENCES

Final Report Ground-Water Resources Evaluation and Aquifer Protection Plan Phase II, for the town of Acton, Massachusetts (Acton Water District), Lycott Environmental Research, Inc. August 18, 1981.

Acton Landfill Study, Goldberg-Zoino & Associates, Inc. (GZA) for the Acton Water District, June 1982.

GZA Letter report, 1983. This letter is referenced in MassDEP records, but was not found in the MassDEP files.

Hydrogeology and Monitoring System Operation at the Forest Road Landfill, Acton, Massachusetts by Richard Cadwgan (consulting hydrogeologist), May 21, 1986 for the town of Acton.

Preliminary Assessment, NUS April 1987...

Final Site Screening Site Inspection NUS May 1991 ...

Final Site Prioritization Report for the Acton Landfill, Roy F. Weston, Superfund Technical Assessment and Response Team, April 1996.

Post-Closure Use Application Minor BWP SW37 for the town of Action Transfer Station, August 2005.

BWP SW 36 Major Post-Closure Use Permit Application
AMEC Environment and Infrastructure, Inc., Project 3652120005

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DRAWINGS

*BWP SW 36 Major Post-Closure Use Permit Application
AMEC Environment and Infrastructure, Inc., Project 3652120005*

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*BWP SW 36 Major Post-Closure Use Permit Application
AMEC Environment and Infrastructure, Inc., Project 3652120005*

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APPENDIX A

LANDFILL CLOSURE PERMIT AND CLOSURE CERTIFICATION

C:\Users\jbanman\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\VM1NAZG3\Draft BWP SW 36
Post Closure Use Permit Application - Acton LF-arm-rjb.doc C:\Documents and Settings\robert.hukowski\Local Settings\Temporary
Internet Files\Content.Outlook\AF01C1724\Draft BWP SW 36 Post Closure Use Permit Application - Acton LF-arm.doc

APPENDIX B

PV SPECIFICATIONS

APPENDIX C

STORMWATER CALCULATIONS

APPENDIX D

GEOTECHNICAL AND LOADING CALCULATIONS

BWP SW 36 Major Post-Closure Use Permit Application
AMEC Environment and Infrastructure, Inc., Project 3652120005

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Post Closure Use Permit Application - Acton LF-arm-rjb.docC:\Documents and Settings\robert.bukewski\Local Settings\Temporary
Internet Files\Content.Outlook\F01C1724\BWP SW 36 Post Closure Use Permit Application - Acton LF-arm.doc

APPENDIX E

MEPA REVIEW

APPENDIX F

CAP INVESTIGATION